

Exhibit A

Rosmarinic acid

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Rosmarinic acid, $C_{18}H_{16}O_8$, is a natural polyphenol antioxidant carboxylic acid found in many *Lamiaceae* herbs used commonly as culinary herbs such as lemon balm, rosemary, oregano, sage, thyme and peppermint.^[1] Chemically, rosmarinic acid is an ester of caffeic acid with 3,4-dihydroxyphenyl lactic acid. It is a red-orange powder that is slightly soluble in water, but well soluble in most organic solvents.^[2]

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Biological importance

Because of the antioxidant activity of *Lamiaceae* herbs in laboratory test models they have been suggested to have beneficial effects in humans.^[3]

Metabolism

Rosmarinic acid is known to undergo metabolism in humans and rats to methylated rosmarinic acid, coumaric acid, ferulic acid and caffeic acid.

References

1. ^ Clifford, M.N. Chlorogenic acids and other cinnamates. Nature, occurrence and dietary burden. J. Sci. Food. Agric. (79) 362-372, 1999
2. ^ MSDS for rosmarinic acid
3. ^ Triantaphyllou, K.;Blekas, G.; Boskou, D. Antioxidative properties of water extracts obtained from herbs of the species Lamiaceae. Int. J. Food. Sci. Nutr. (52) 313-317, 2001

See also

- Caffeic acid
- Coumaric acid
- Ferulic acid

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Categories: Antioxidants | Carboxylic acids | Phenols | Phenylpropanoids

Rosmarinic acid	
IUPAC name	(2 <i>R</i>)-2-[[[(2 <i>E</i>)-3-(3,4-Dihydroxyphenyl)-1-oxo-2-propenyl]oxy]-3-(3,4-dihydroxyphenyl)propanoic acid
Identifiers	
CAS number	537-15-5
PubChem	5281792
SMILES	<chem>OC1=CC=C(C(=C1)C(=C/C=C/C(=O)OCC2=CC=CC(=C2)O)C(=O)O)C(=O)O</chem>
Properties	
Molecular formula	C ₁₈ H ₁₆ O ₈
Molar mass	360.31 g/mol
Melting point	171-175 °C
<p>Except where noted otherwise, data are given for compounds in their standard state (at 25 °C, 100 kPa)</p> <p style="text-align: center;">Infobox references</p>	

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